# PATENT ABSTRACTS OF JAPAN

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(54) PRINTED WIRING BOARD AND MANUFACTURE THEREOF

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### [ anab nottelenesT]

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Substituted by singled by sheppenessing all volument in their was bread below bashing off [6 min(6)] I mislo ni braod beniw beaning arts ni yhiidixell sad doidw (Claim 8) The printed wired board to whitch an insulator is characterized by being the inculation sheet

8-1 smisls to risecrade enuscement by the destruction of the particle of the second of circuit in claim 5 is characterized by having flowed electrically.

(Slame of the multipolities approach to a printed wired board fatt between the circuits of the multipole.

messen gaineliam in a bre . I misto ni matten tostoubnoo eth to misemre sationen y d suomo Claim 5) The manufacture approach of the printed wired board characterized by forming a multilayer

sean/kning pattern in \$ or 3, and an inculating pattern being equal thinkness.

mislo to resmioints art ye describes the characteristic of the control of the characteristic of the characteri

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Claim of The manufacture approach to the printed based characterized by forming the conductor

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send baring and the list list list the manufacture approach of the other states only the states.

computer and is characterized by carrying out pattern formation to this graphic form information by a ofni stveni fi "nottermelni imrel siderg otni metter insulazina bne metter votubnos e ginlam the link let method, Moreover, in the manufacture approach of the printed wired board of claim 3, by brance, and is characterized by claim 2 forming said conductor pattern and an insulating pattern by to souther sett no viauosnatumiz metteg gnitaliam na bns metteg rotoudnos a gnimot yd bezitetarafo bread being a string and the meaning and string in the printed whed beard bandinant-avoda sets niests of setro in badaliquios as incimanti sint fine above abadant for Solving the should need the setaraneg bind atzew gnirtota non bind generates. sinns at effer of the manufacture approach of the printed wired board which neither harmful plating is similar critical behind behind seems of the corpus authorities whed board. Moreover, it soliszeorq bns --- and long duration --- solving --- the easy manulacture approach --- and processing esensuonamun arit, bused beniw batriiva a to suutestunam ni metter fuorio arit to sascora noissimot arit to viixelamos ent seruines notinevni ents eits. Emeldorq vinam (notinevnt ent yd bevloč ed at (s/meldorq)

thy film process, the atching process, etc. are required, and have not led to zuch process shortening. be skipped when based on the latter build up method, the perforation process, the precise, the oso. Innatem geneever, although a part of laminating processes, euch as prepreg material, can as bns. seecon notisarivor in species in a plating process or a pattern formation process, and an is is difficult to put reinforcing materials, such as a glass fiber, into a substrate, a problem is in blom ozueza for the besed on the holid behavior to the bese on the Mitteux on the Mitteux on the Mitteux of the behavior of th method Moreover, in 38,23,8659, A to 4,928,48, the manufacture approach of the multilayer printed or 244138, A. short-aning of a pattern formation process is measured by using the Mitcuzo form etching process, in order to solve these problems, various proposals have seconglished. For example, in sery. Moreover, it sleve his problems, such as weste fluid processing generated in a plating process or an the printed wired bosed industry. Especially, in the case of a multilayer-interconnection plate, this can ensign of the pight and reduction of this conversion ocet has been the big technical problem of a of the time amount which sach process takes, the rate of the conversion cost cocupied to a electrolysis galvanizar are formed through an etching process, a solder exfoliation process, etc., when patterning procese by the partoration process, the electroless deposition process, a dry film, etc. and Substitute and yet bemindred at brand believe behing a to nothermof medday strauta villarenes [6009]

high performance-ization of a semi-conductor. the circuit and densification of the circuit pattern is carried out by the ministurisation of a device, or or demand characteriatics, respectively, these printed wired boards ---- each ---- a conductor ---- it has seme field of a double-sided piete, a piece face-plate, etc. is properly used according to an application thing of a monolayer is divided into two or more multilayer boards etc., and the circuitry layer on the and as bied amas and no reval viblicatio and sreval viblicatic to recining and to weiv rd Llaisstan exact a as an epoxy resin, There are some which use flexible films, such as polyester resin and aramid resin, as cissass and use a consmic as a base material, such as a thing and a glass fiber, and synthetic resin, such for them. The thing using the composite of rainforcing materials who a printed wired board has many is electronic equipment, communication equipment, a computer, etc., and the printed wired board is used [Description of the Prior Art] Semi-conductors, various electronic parts, etc., such se LSL are mounted [2000]

ednibuseut, etc.

posto rised for electronic equipment, an electrical machinery and apparatus, a computer, communication essa journation of a conductor pattern especially about the manufacture approach of the printed wind

Moreover, the heat-curing mold solder resist to which the ingredient for forming an insulating pattern salver dust, and what mixed the solvent, the curing agent, the dispersant, the antioxident, etc. is used resin and an epoxy resin are made to distribute conductive ingredients, such as copper powder and predicting the ingredient for forming the conductor pattern in this invention. As conductive ink, phenoi desirable for the thickness of both the patterns in a uner layer circuit to be the same. Conductive ink be simpst agust and, in the case of the printed wived board which has especially a multilayer circuit, it is of assembling rot elderiese at it. Visuoenealiumis barmet enterior montherm suft in matter gardeluers bas ordeseing, a processing facility, etc. of these waste fluid are unnecessary. As for the conductor partern .006 bind starw grintose, bluit assew gnitists to generating on osis at start some stonershing [8000] and an easy dryer can make it what is necessary be just to be in facility and cheapity. studnos a diffw ballockerni bodisem set kai edt to mempione notkernot anstren edt fud babaan si villiset no performed eacily for etching acreen printer not the facility for etching alon in circuit forming mathod for having required the long time, it can be markedly alike, and pattern formation simultaneously at 1 time of a precess, and pees many conventional processes --- as compared with the mediang graphic form information into a computer, form a conductar partiern and an insulating pattern into the computer by connecting computers, such as a personal computer, with an ink let printer. by errough. Moreover, a pattern can be formed on an insulator using the graphic form information inputted minnantere. Therefore, it can respond also to the demand on the densitiostion of a circuit pattern 00r rueds yd tuo beirran ed nan richte aft ac or eth a restrau to aninnint Jaeini ot alotinaq Ani of the discolution can be set up in the range of 200 - 1000doi by adjusting the magnifude of the according to the configuration of a pattern, the clase of thickness and ink, etc. In the case of an ink let nestrod can be used for the suit jet method used for this invention, and it can be suitably chosen viscosity ink molta, a continuation injection molt suitable for mass production method, etc. Either of said thermotusion nature ink mold, an electrostatic-induction mold, a sound ink print mold, an electric es plan meavarie ne chiom rai elddud a chiom ecret-conference metare as esta analy, alquiexe (2001) There is a method of various types in an ink let printer with the injection method of ink. For the mk jet method well used for the printer of a personal computer etc. recently. sau of fine and selection of different parterns on the same side is no limited, it is used for it to use have touched by the same thickness on the boundary. Although especially the saproach of forming and the toth the party she patterns formed elimits neonally croseed, or did not lep selectively, and cristing articularities of the and the mettern pattern and the pattern and the other insulating pattern in the contract of the pattern and the contract of the to brand begins betrifue and to descripe substantians and of antistical soft be substant and bear to be an income of the principal soft of the principal s most barrnot ai notinevni ains to bread basiw bestring ant to riceorage austrationam ans yd barusoatunam brand betriff ent to shie frictic ent terifores. Therefore, the circuit of the shirt entres of the principle of the spirit entres of the control of the cont and from a standard and the bread benive basters as so so so so show in the thickness in slower areas and the control of the c serio ent suo asmiaq matseg gnisalismi en gheer band, an subsenza de E-2 suote se asserbiets bas pattern formed on the surface of the printed wired board, it is obtained by usually etching copper foil. diuctio and to gninft and two atmos mastes notochoop A benislays at methes gnitelized as bus notherwi this in beau mentag retoukness of the saguence of the continuous and I mountain in this

White and T mists ni brand beniw betring arts

manufacture approach of the printed wired board characterized by having flowed electrically. Claim 7 or this invention finds out that solution of said technical problem is possible, when it is the printed by the manufacture approach of claims 1-8, claim 8 is characterized by the manufacture approach of claims 1-8, claim 8 is characterized by the manufacture approach of claims 1 and claim of consideration that grade the printed with which the insulator in as the printed with which the insulator in

and an acutating pattern into equal thickness by the manufacture approach of plaim 4, and repairing manufacture and an insulating pattern described above in claim 5, and an insulating pattern crossing by claim 5 in claim 6 is the standard pattern for a the circuit of the multilayer curouit obtained by claim 5 in claim 6 is the

part, and pattern 2s of a two-layer eye and 2b are formed on the patterns is and it of the let layer. pattern, drawing 2 R > 2 (b) (a) 2B — the conductor pattern is top which is a sectional view for a line The circuit pattern for a flow is shown, 2s shows a conductor pattern and 2b shows an insulating. (a) Amilyand, visviduacast, vitalimis rayal byt orth to welv landinose arts bna "aniwath masted, aye tayal "owi ant works ( arinesh bins S. CH Saniward bermotes is pender in gainether demote as with a second and a second and sec and first with with orbits to be been a seatured gardeent a nevo lie O seesue of 1001 fe being a travior A same thickness is shown in the case of this example, the thickness of a pattern made it 25 minormeters. erit yd bernof gniad bns ,8 mili ebimiylog a no yrabnuod a gniriouot a'i mattagaini anisaliasii bna a'i mattag ofher than the conductor pattern which can be set are insulating patterns. (b) in \*\*\*\*\*\*\*, conductor and t et bas mothers, and width of face is 150 micrometers. It shows an insulating pattern and is 1, Parta a sworks tas bne befod ad neo ricitiv at (a), invorte si see of neo ricitiv fraq enil AA to weiv tanouses of T (a) I aniwarb at (d) I aniward and oblimited on the barmer I tal set to aniware matter rworle ! (a) | ariwer O brend believe bestring a to nothermos method arts anietate aniwaria usek [1100] Visuouning bermothed ad neo tel and st he mether the methed white gritch

and hear—curing type, and letting a heading furnace (not shown in drawing  $\underline{\delta}$  ) pass. In the case of quick equt thevies a to seed out of mannaupe te, an aniwoliot besu an out yet bemoned one aminebrad rebuild and notice and the viole selector \*\*\*\* a most actory and ent ni e notationi na to seet most ent ni admost Visuoeneilumie ens metten gantsiumi na bna mettem ond en insulating pettern ens e brothe pettern ensulatione personal pe on the base material which can convey an insulator 9 to a traveiling direction, and were sent from the be slid to the cross direction and a longitudinal direction, and installetion immobilization was carried out neo richiw 8 elszon 1ej Mri ent zert 01 vetugmoz lanosren ent of besoennoo f mampiuse sej Ani ent richw ateb nottermoini moit airiqeng ent. E gaiweib ni nworle se notteruginos e to triemquipe ent no based was i bne besu sew tel. elddug of pinit ant treslator, the trining of Bubble Jet was used and it was se niesi recentrates se conductive init. As init jet equipment which forms a conductor pettern anivervent and besu base octourned as a selection to been dichy win out an artistical and selection. tor in the was used as an insulator. The solder resist of an epoxy resin avatam was used as ink for 001 to estandants a thire mittle ebimiylog est T. mworts at messter reverteevent a to exotelees of the original beg orth sad right branches with bearing of the orthogonal base of the branches as set follows:

blating process.

elori riguonda e bne sesporg gnillina a animorhed tuoritikv, vitisse benistdo ed neo eleiq noticennocrafini onductor pettern. The petchbosm which has the same effectiveness as a through note multilayer... conductor pattern which makes it flow through between the upper conductor pattern and a lower laver and selectiveness as a strong hole petchboard can be matufactured by forming in an interlayer the can be manufactured, and in a multileyer printed wiring board, the printed wired board which has the braod gnitiw baining tavalithm a betasqet zi mettsq gnitsluani na bna prestaq votoubnos a to noitemot auconstiumis it incities in the control of the menutecture approach to the invention. It simultaneous banning isuan radivud sitt või beau atsmimsi yxoga asatg anti skindr rakidat a bna, larietam nottourtanoo ni teste s to ageits of the desires or the epoxy retain sew bus miser in sold served in the sheet in polyimids film and a glass fiber and polyester fiber, and erometic polyemide liber were made to carry out s shi mit sattestroment s bns mit shinstic polysnics in mit retestic by polysnics sin into s and a start see that so curved surface is sufficient as four in int jet is positive. What textiles and remains especially the ineulator used for this invention is geometrically desirable. Moreover, even if sed tabular, and the thing of the shape of the shape of a film ar a sheet can form a patterned layer (2009) Since it has flat-swisce configurations, such as the chape of the chape of a film, and a cheet. lower layer pattern.

hardening type ink, heat bardening is performed, and it achieves fixing unification to an insulator or a Praporated by pattern formation afterbalong desiccation. Furthermore, continuously, in the case of ei Inevice s ini za bezu zi kni egyt thevioz nedW Meu se thenoqueo legioning a se nisa vyzode na sesti

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## [Snob noitalans:T]

vzse oels si shiveysifilum tant them ent tant it bns lieus sens en de pirch can be price oel to this with Moreover, the printed wired board by this invention can make processing cost cheap, and further, circuit as were fluid processing are not needed, sither, but the ment as the maintacture approach is large. to be light of the series of the second anite and bioth stew and to anitare ser on anitote for a stort time. Moreover, according to the manufacture approach of this invention, there is neither set enutraturam at st baldens notingwrit sitt to braad beniw betring out to desorges esuspailurem out yd board which required the conventional complicated process and circuit formation had taken time amount [Effect of the Invention] The equipment and the approach with easy manufacture of the printed wired Viese barufasturism ad

the soprosed of this invention shove, and between three-layer circuits has flowed wer able to in this part. The multiblayer printed wining board for chip resistors strucush which had the three-layer the part of the pad path clearance of 4c. and it connects with the terminal of a chip resistor with solder seve is formed on the three-layer pattern. The circuit of the 3rd layer has come out to the front face in 4th earl for sevious injective at \*\* DD'part -- (c) it is, it is also protective lever of the 4th a of \*\*\*\*\*\*\* succepts al layer of earlies for the circuit of the 3rd layer is expected from the party of the eff to movie as we were the act to methed notalizari and to mothod out in barmo! When a revel earth Drawing 4 (b) it is drawing in which the fluorozcopy section of the conductor pattern of one layer " injected by this part. Usually, it considers as the printed wired board for chip resistors in this condition. (8) It eats, 4b shows an insulating pattern, 4c shows pad barrance, and ink is not nothreviti eith to docorage off ye does must be an tothe approach to the invention.

drawing 1 - \$, and an insulating pattern. Therefore, it can carry out with the screen printing of the like into a conductor pattern like and the pattern which forms sumitaneously a conductor pattern like and a conductor --- it is what made it the key objective to prepare the pad path clearance for making depended only on an insulating pattern — it is — a conductor — protection and the chip of a circuit. the latester -- it had flowed by the circuit and the circuit of a two-layer eye. (a) of drawing 4 what is circuit, the conductor of the 3rd layer -- a circuit -- CC' -- the place of an except -- the conductor of conductor of is and 3s -- a circuit -- the conductor of 2s -- it turns out that it has flowed by the the contract is carried out on a beliming this in the same leaves to revei by the where sequential formation of the pattern of the lat layer, the pattern of a wow-layer eye, and the sold off work & bne & ni welvier deading and each sectional view in & and sold only the place "88 , E arriverto bne , S arriverto , I arriverto ni "AA bequel seri ebreviqu si ribidivi eli metteq notaubrico 8B of a two-layer eys -- the upper conductor pattern 2s top -- CC of the 3rd layer -- a part of "" viscoegso --- \*\*\*\* --- gained -- d2 bns .eyer eye. and 2b --- \*\*\*\* on the side is the eds in the distribution of the companies of the eds in th pattern. (b) \*\* (a) The sectional view in OCTine is shown from this sectional view, the patterns 3s and (0) (a) of drawing 3 it is a circuit pattern, and 3a is a conductor pattern and 3b is an insulating del yem anil a no as marraq

and is in AA'line of the 1st layer especially -- 88 two-layer eye --- it is formed so that conductor

31n the drawings, any words are not translated.

#### DESCRIBLION OF DRAWINGS ...

[Brief Description of the Drawings]

CURBINE 1.1 The conductor pattern of the 1st layer, the example of an insulating pattern, and its

[Milking 2] The conductor pattern of a two-layer eye, the example of an insulating pattern, and its cectional view are shown.

cections! view are shown.

eschonal view are shown, est one creating autistized in the definition of the 3rd leyer, the example of an including pattern, and its

fluorio e to weiv lançizose arti bris griwerb Washing 41 the exemple of the insulation pettern of the 4th layer, and a conductor — the perspective

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[amigratoM to notidispand]

1a.1 layer cenductor pattern I. Example of Pattern of the 1st Layer

An insulating 1b.1 layer pattern'

2. Example of Pattern of Two-fayer Eye

The conductor pattern of a 2s, two-layer eye

3. Example of Pathern, of the 3rd Layer The insulating pattern of a 2b. two-layer eye

3a.3 layer conductor pattern

metteq seyet 6.d6 aniteluani nA

matted revel 4.da gnitslueni nA 4. Example of Pattern of the 4th Layer

4c. Pad path clearance

5. Perspective Drawing of Conductor Pattern

notions metted antichent .46 Da. The fluoroscopy section of a conductor pattern

6. Insulator

7: Ink Jet Equipment

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8. Inh Jet Mozzie

9. Computer (Personal Computer)